



October 11, 2019

The Honorable Zora Mulligan
Commissioner
Missouri Department of Higher Education and Workforce Development
205 Jefferson Street
P.O. Box 1469
Jefferson, City MO 65102

Dear Commissioner Mulligan:

Please accept Harris-Stowe State University application seeking a statewide mission in STEM for consideration by the Missouri Department of Higher Education and Workforce Development and the Coordinating Board for Higher Education at its December 10, 2019 meeting. Harris-Stowe appreciates this opportunity and believes that as an open-enrollment institution serving underrepresented and under resourced students it has demonstrated sufficient evidence, as required by the legislation, to have the capacity to discharge successfully such a mission.

Since its founding in 1857, HSSU is dedicated to delivering a quality education to underserved populations while developing the whole student and enhancing the economic capacity of underrepresented citizens in Missouri. HSSU's priority towards servicing a majority African American student population along with its history of producing quality graduates, positions the University as a key partner and friend to Missouri with regard to increasing and diversifying Missouri's STEM Workforce and furthering economic gains in STEM.

At HSSU, we believe it is vital for the institution to do its part to strengthen Missouri's STEM Workforce and produce quality employees representing diverse backgrounds.

Our ability to support student persistence to graduation, increase enrollment in graduate school and expand the number of African Americans entering jobs positions the University as a leader for advancing equity in Missouri's STEM workforce.

I thank the CBHE Board for affording the University this platform to express how HSSU advances STEM for underrepresented students in the state of Missouri.

Sincerely,

A handwritten signature in black ink, appearing to read "Dwayne Smith", followed by a long horizontal flourish.

Dr. Dwayne Smith,
Interim President



INSTITUTIONAL BACKGROUND

Harris-Stowe State University (HSSU) is the only historically Black college or university in the St. Louis metropolitan area among ten colleges and universities, and one of only two HBCU's in the state of Missouri. The University has a current total enrollment of 1,629 students, of which 84% are African-Americans. More than 70% are first-generation college students from low-socioeconomic backgrounds and a full 83% of HSSU's student population are Pell grant-eligible. Although HSSU is one of the smallest higher education institutions in the state, it ranks only behind the University of Missouri System in conferring the largest number of undergraduate degrees in Math and Biological Sciences to African-Americans among all four-year public and private colleges and universities (IPEDS, 2015-2018).

CBHE-APPROVED MISSION DESCRIPTION

Harris-Stowe State University, located in St. Louis, Missouri, offers baccalaureate and select master's degrees to address the higher education needs of the St. Louis metropolitan region. Harris-Stowe State University is designated as an open enrollment institution. Harris-Stowe is designated as one of two Historically Black College and Universities (HBCUs) in Missouri and serves African-Americans and other diverse student populations throughout the state.

Harris-Stowe State University serves its constituents by offering baccalaureate and master's degrees in business, education, and the arts and sciences appropriate to a teaching institution with a predominantly urban undergraduate student body. Harris-Stowe State University has particular strengths in mathematics and other STEM fields, and is one of the state's largest producers of African-American graduates in STEM fields, with biological sciences as one of its top ten highest producing programs.

Harris Stowe State University also fulfills its mission by offering services to promote and sustain economic development, small business development, and workforce development, in addition to a broad range of academic and cultural activities and events.

ACADEMIC UNITS

Anheuser-Busch School of Business (ABSB)

The Anheuser-Busch School of Business offers undergraduate on-campus and on-line programs to educate students in the art and science of business. These programs prepare students to become business leaders with a global mindset equipped with the ability to identify, analyze, and solve complex business problems.

These programs foster the development of knowledge and skills necessary for gainful employment and the successful pursuit of graduate degrees. The School creates an environment that promotes



the intellectual, ethical, and social growth of students through critical thinking, superior verbal and written competencies, and decision-making skills in a technologically complex and diverse global marketplace.

The School of Business is one of the largest degree producers of African-Americans in the State in the following degree programs:

- Health/Health Care Administration/Management
- Management Information Systems General
- Business Administration and Management General
- Accounting

College of Arts and Sciences (CAS)

The College of Arts and Sciences at Harris-Stowe State University is committed to providing all students an accessible and affordable quality liberal arts education in mathematics, physical and life sciences, humanities, and social and behavioral sciences. The mission of the College of Arts and Sciences is twofold: (1) to train and educate graduates who will demonstrate effective written and oral communication skills and are able to think critically and make decisions for the common good and (2) to produce graduates who are equipped with strong academic and practical knowledge to pursue careers in mathematics, life science, law enforcement, government, education, and business.

The College of Arts and Sciences also provides course offerings in general education. In this role, the college is the gateway to all degree programs at the University. In addition, the College of Arts and Sciences, in collaboration with the College of Education, provides course offerings in many content knowledge areas, including mathematics sciences, natural sciences and social & behavioral sciences leading to Bachelor of Science degrees in Early Childhood, Elementary School, Middle School and Secondary School Education.

Each of these degree programs are designed to prepare a specialist who will assist in identifying, formulating, and solving urban problems.

The College of Arts and Sciences is one of the largest degree producers of African-Americans in the State in the following degree programs:

- Urban Studies/Affairs
- Criminal Justice/Safety Studies
- Biological Science
- Mathematics

Harris-Stowe is also ranked **#47** in the nation in graduating African-Americans in Mathematics.



College of Education (COE)

The College of Education at Harris-Stowe State University offers baccalaureate programs designed to enrich and enhance the academic as well as socialization experiences of its students. Toward this end, diversity pervades the curriculum, the field placements, faculty, and clinical staff. Candidates understanding of their culture and respect and responsiveness for others is a basic premise of the College of Education.

Faculty and candidates in the College of Education integrate technology throughout their experiences in the course and field placements. Technology is viewed as improving teaching effectiveness, enhancing instruction, and managing students and assessment while motivating students to engage in the use of technology to enhance their performance (CAEP).

The Educator Preparation Program (EPP)'s conceptual framework revolves around the principle of preparing a culturally sensitive population of individuals who will adapt and perform successfully in an ever-changing technological world. The theme undergirding this work is "Reflective Practitioners for a Diverse Society." The framework is aligned to state, national, career readiness, learning/common core, and accreditation standards and informs the EPP's mission and structure. The College of Education partners with several school district's in the region whose student populations come from underserved backgrounds, including Confluence Academy, Jennings School District, the Normandy Collaborative School District and the St. Louis Public School District.

The College of Education believes that effective teachers are professionals who possess and exhibit competence, respect for diversity, professionalism, and reflection. The College of Education trains teachers to be Reflective Practitioners, counselors, users of technology, skilled instructors, organizers of learning, diagnostic prescribers, communicators with parents, masters of content, deliverers of content, evaluators of student progress, inclusionary strategists, managers of behavior, and advocates for social justice.

The College of Education is one of the top producers of African-Americans in the State in the following degree programs:

- Education General
- Early Childhood Education and Teaching

The College of Education is Ranked **#41** in the nation in graduating African-Americans in Education.

Infrastructure

Harris-Stowe's 20-acre campus is located in Mid-town St. Louis. The campus is comprised of the Dr. Henry Givens Jr. Administration and Classroom Building, the AT&T Library, the Emerson Performance Center, the William Clay Early Childhood Center/Teacher Education Building, Gillespie Hall and Bosley Hall. The campus also includes the former Vashon Community Center,



a historic building that is being renovated to serve as the University's library and repository for historic collections.

STATUTORY CRITERIA

- a) Institutional enrollment
- b) Programs of unusual strength
- c) Articulated admission standard
- d) Academic emphasis at the undergraduate or graduate level with a demonstrable capacity to provide significant public service
- e) Continuous quality improvement and institutional accountability

- a) **Institutional Enrollment** - Enrolling one or more groups of special population students such as minorities, economically disadvantaged, or physically disadvantaged from outside its historic statutory service region at rates exceeding state averages of such populations enrolled in the higher educational institutions of this state

Consistent with statute §173.030 (9) (b) Harris-Stowe continuously serves one or more groups of special population students, including a large number of minority and economically disadvantaged students. The University has never wavered in meeting the needs of the citizens of the State Of Missouri by offering undergraduate degrees at one of the lowest tuition rates within Missouri's system of public higher education. This effort has been responsive to state needs for cost-effective college education and commensurate with §173.030 (8). Harris-Stowe State University has a unique mission of addressing the unmet higher education needs of the St. Louis metropolitan region and has been privileged to do so for well over a century. The University is strongly dedicated to providing a high-quality higher education experience that is both affordable and accessible to a diverse population.

Harris-Stowe State University enrolls a diverse cross-section of students. The University has a current total enrollment of 1,629 students, 84% of which are African-American, the highest percentage of African-American students enrolled in any higher education institution in the State. Moreover, as an open-enrollment institution Harris-Stowe perhaps has one of the highest first-generation student populations (70%) from a low socioeconomic background with 83% of students qualifying as Pell eligible, the highest percentage of Missouri's higher education institutions and one of the highest percentages in the nation. According to the National Center for Educational Statistics, 72% of African Americans receive Pell Grants, the highest percentage of any group receiving Pell. Harris-Stowe's percentage is higher than the national average.

For comparison purposes, a 2014 MDHE statistical summary on the Historical Trend in Total Headcount Enrollment of African-American Students at Public and Private Not-For-Profit (Independent) Institutions indicated that Harris-Stowe had an African-American student population that made up 83% of its student body. Lincoln University followed with



an African-American population of 39% while all other public four year institutions served an African-American student population ranging from 3% - 14%.

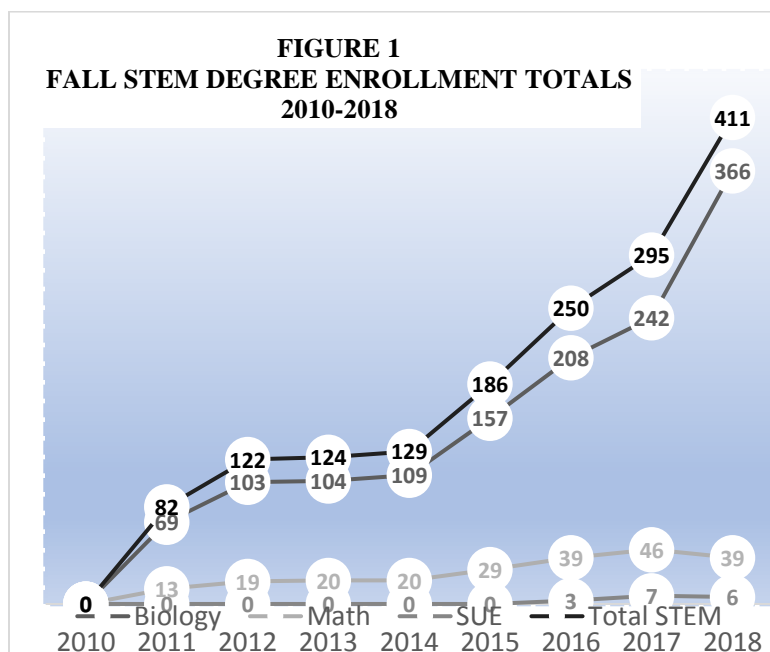
Total fall enrollment increased 34% over the past five years with an increase of 126% of new freshmen and an 81% increase in overall new student enrollment of freshmen and transfer students. Enrollment in STEM programs has experienced significant growth increasing by 401%.

These increases in enrollment are matched with upturns in persistence, retention, and graduation rates. Fall to fall retention has increased by 19% since 2014. Additionally, Harris-Stowe graduated the largest class in its history during the 2018-2019 academic year with an overall increase of 48.5% in degree production since 2014.

HSSU launched bachelor degree programs in Math and Biology in 2010 and has rapidly grown enrollment and STEM program offerings. As of fall 2018, Harris-Stowe has 411 STEM majors (366 Biology, 39 Mathematics, 6 Sustainability and Urban Ecology) with at least 86% being African-American (5.8% unreported race/ethnicity). This represents a 40% increase in STEM majors compared to fall 2017.

Additionally, the University has engaged its students in undergraduate research, which advances the participation of underrepresented students in research activities locally, regionally and nationally. Harris-Stowe State University has leveraged its NSF partnership to aggressively promote and support student research opportunities that foster enthusiasm, a sense of belonging in STEM communities, and build practical skills and knowledge. The Implementation grant supported undergraduate research efforts resulting in a total of 29 undergraduate research projects and 60 student research presentations (includes presentations at HSSU hosted symposiums). In addition, through its MOLSAMP Alliance, Harris-Stowe has supported underrepresented minority students with attending and presenting at research conferences.

In total, Harris-Stowe students have captured 11 undergraduate research awards including six first place finishers, four second place presentations and one third place award. Examples of competitive undergraduate research competitions Harris-Stowe students have participated include the American Association for the Advancement of Science (AAAS) and National Science Foundation Emerging Researchers National Conference on STEM, the Eaton Technical Conference, the Minority Access Inc. National Role Models in STEM Conference and the MOLSAMP Undergraduate Research Symposium.



b) Programs of Unusual Strength

HSSU's STEM programs of unusual strength, specifically those housed in the College of Arts and Sciences and the School of Education, have experienced significant growth in the last eight years. Program Highlights:

- A HSSU graduate earned the National Science Foundation Graduate Fellowship, the highest award bestowed upon undergraduate STEM scholars;
- HSSU developed and launched 12 STEM majors, minors and certificate programs.
- 100% of STEM faculty possess a doctorate in STEM fields;
- Over 50% of HSSU's Honors College students are seeking STEM degrees;
- STEM graduates have been accepted and enrolled in competitive master's and doctoral programs from institutions as diverse as the University of Colorado, University of Kentucky, Indiana University, University of Missouri, Columbia, Saint Louis University, Southern Illinois University, Carbondale and Alabama A&M University and Washington University in St. Louis;
- Developed a first of its kind partnership where students earn a math degree from Harris-Stowe and an engineering degree from St. Louis University Parks College of Engineering. The first cohort of students are currently completing their engineering degrees;
- Developed and launched a joint baccalaureate/master's degree program with Washington University's School of Medicine in Occupational Therapy. Harris-Stowe students begin the graduate program in their senior year;
- HSSU faculty have pioneered 65 new and innovative STEM courses;
- STEM is a degree program of choice for Harris-Stowe students with 32% of new Freshmen choosing a STEM program as their degree path;
- 25% of Harris-Stowe's in-state students are STEM majors;



- HSSU received the HBCU Digest Award as the 2019 Best STEM Program in the nation among HBCU's.

Quality of program faculty as measured by the percentage holding terminal degrees, the percentage writing publications in professional journals or other appropriate media, and the percentage securing competitively awarded research grants which are higher than average:

One hundred percent of full-time faculty hold a Ph.D. in their fields from leading institutions such as Washington University in St. Louis, Saint Louis University, Washington University, the University of Vermont, the University of Michigan and Duke University.

Since the establishment of STEM degree programs in 2010, seventy percent of full-time STEM faculty have been awarded competitive research grants and now serve as a Principal Investigator or Co-Principal Investigator. In addition, eighty percent of STEM faculty have served in some capacity in securing these grants that total \$12,099,766 over this nine year period. STEM faculty have created an aggressive culture of competing for grants at the federal level. As an example, faculty members who began work at Harris-Stowe this semester are already collaborating with colleagues to submit a NSF proposal in November of 2019. For comparison purposes, the 2018 Science and Engineering Indicators report published by the National Science Foundation states that in 2015, 41% of all U.S.-trained S&E doctorate holders in academia and 52% of those for whom research was a primary or secondary activity reported federal government support.

Securing such funding has assisted HSSU with servicing students across Missouri to increase the number of STEM graduates, improve STEM retention, and expand undergraduate research opportunities for underrepresented minorities across the state.

Eighty-eight percent of the full-time STEM full-time faculty have published articles in professional journals throughout their careers as faculty members.

Meeting Statewide Needs

Harris-Stowe has the ability to produce a critical mass of students that support state efforts outlined in CBHE's Preparing Missourians to Succeed: A Blueprint for Higher Education. Harris-Stowe's efforts will assist the State in meeting all five goals of attainment, affordability, quality, research and innovation and investment, advocacy and partnerships. Harris-Stowe will play a key role in ensuring that Missouri reduces disparities for students by raising completion rates by race, ethnicity, socioeconomic status, gender and disability by 50% by 2025. (MDHE). Through continuously advancing the growth of African-Americans with STEM degrees in the state of Missouri, Harris-Stowe has demonstrated that it is equipped to support statewide efforts \ focused on ensuring that "Every Missourian is empowered with the skills and education needed for success." Harris-Stowe is well positioned for delivering optimal impact on Missouri's social issues (disparities in



education, economics, and health) centered on STEM. With a long-standing tradition and heritage of providing instruction to a minority-majority student population, Harris-Stowe State University has several programs of unusual strength that respond to statewide needs for the following:

- a. Increasing the percentage of underrepresented minorities, specifically African Americans, in Missouri's STEM workforce
- b. Developing a teacher education pipeline that increases the number of teachers of color equipped to deliver STEM Education in K – 12 settings
- c. Eliminating educational disparities existing in STEM to enlarge the number of underrepresented minorities who attain STEM degrees, which aid in reducing disparities in health and economics.

a. Expand the percentage of underrepresented minorities, specifically African-Americans, in Missouri's STEM workforce.

Black and Hispanic workers continue to be underrepresented in the STEM workforce. Blacks make up 11% of the U.S. workforce overall but represent 9% of STEM workers, while Hispanics comprise 16% of the U.S. workforce but only 7% of all STEM workers (Pew Research 2018). During the 2018-2019 Academic year, 26% of Harris-Stowe's student population was enrolled in STEM-related degree programs. Through educating this minority-majority population, Harris-Stowe is positioned to produce a substantial share of diverse STEM workers for Missouri.

In addition, an expanded STEM infrastructure at Harris-Stowe has significant implications on Missouri's capacity to diversify its STEM workforce and strengthen its efforts for supporting a national agenda around STEM diversity.

b. Grow a teacher education pipeline that increases the number of STEM teachers of color equipped to deliver STEM Education in K – 12 settings.

STEM education suffers from a disproportional underrepresentation of diverse people in teaching positions. Even though the majority of students in our education system are now from diverse communities, K-12 teachers are still overwhelmingly White. With many national and state programs focusing on increasing the number of STEM teachers in the classroom and the number of students choosing STEM in their career pathways, there is a significant available opportunity for these programs to have special focus on increasing the diversity of STEM teachers (Smithsonian Science Education Center, 2017). The School of Education at Harris-Stowe State University is equipped to fill teacher diversity gaps and produce qualified teachers of color skilled at delivering STEM education.

With roots grounded deeply in teacher education, specifically, instruction delivered to a minority-majority population, Harris-Stowe as an open enrollment institution produces quality STEM teachers of color for Missouri. Thus contributing to, national and state-led and efforts for diversifying the teacher education pipeline for K – 12 schools in America.



Harris-Stowe's unusual strength of its teacher education program bolsters state efforts for advancing College and STEM readiness and increasing participation of underrepresented minority students enrolled in STEM degree programs.

c. Decrease and eliminate educational disparities existing in STEM to enlarge the number of underrepresented minorities attaining STEM degrees.

One potential barrier for those wishing to enter the STEM workforce is the generally higher level of educational attainment required for such positions. Among college-educated workers, one-in-three (33%) majored in a STEM field. But only about half (52%) of those with college training in a STEM field are currently employed in a STEM job (Pew Research, 2018). As Missouri invests in higher education initiatives, Harris-Stowe, through its portfolio of STEM programs, is poised to produce a significant portion of Missouri's annual population of citizens graduating with STEM degrees.

Through its STEM portfolio of programs of unusual strength, Harris-Stowe is increasing the number of STEM degree recipients for the state of Missouri and aids in growing economic gains for its citizens. Among full-time, year-round workers ages 25 and older, median earnings for STEM occupations were \$71,000 in 2016. Comparable earnings for non-STEM workers were \$43,000. Thus, STEM workers typically earn about two-thirds more than those in non-STEM jobs (Pew Research, 2018).

c. That the institution has a clearly articulated admission standard consistent with the provisions of subdivision (6)* of subsection 2 of section [173.005](#) or section [174.130](#)

Harris-Stowe is designated as an open enrollment institution and may admit any Missouri resident with a high school diploma or its equivalent as a first-time, full time degree-seeking freshman. With this designation Harris-Stowe admits students into STEM programs who might not have opportunities elsewhere.

d. Academic emphasis at the undergraduate or graduate level with a demonstrable capacity to provide significant public service.

Harris-Stowe provides STEM programming to the community through several educational outreach programs. As part of its Verizon Innovative Learners program Harris-Stowe has hosted, since 2016, over 300 African-American middle school males on its campus. In an attempt to introduce more minority males to STEM degree programs and careers, the program focuses on 3-D printing, app development and coding. The program offers an academic year component and a three week summer program creating a true k-16 STEM pipeline. This STEM program could serve as a prototype in the state for partnerships between a higher education institution and the business community expanding STEM opportunities for under-resourced and underrepresented students.



Since 2017, Harris-Stowe, through funding from the U.S. Department of Education's Minority Science and Engineering Improvement Program, has provided professional development opportunities to high school teachers in the St. Louis metropolitan area in Sustainability and Urban Ecology. The program also provides educational opportunities for area high school students to learn about STEM careers related to Sustainability and Urban Ecology. Harris-Stowe STEM students act as mentors to the high school students during a three week summer program that allow high school students to study science on a college campus.

Additionally, since 2016, Harris-Stowe has acted as the lead institution for a \$5,000,000 National Science Foundation sponsored Louis Stokes Alliances for Minority Participation grant that brings together eight public and private universities:

- University of Missouri Columbia
- University of Central Missouri
- Missouri State University
- University of Missouri at St. Louis
- Washington University in St Louis
- Truman State University
- Lincoln University
- St. Louis Community College

The goal of the alliance is to substantially increase recruitment, retention and graduation of underrepresented minority students pursuing STEM degrees in the State of Missouri. This alliance will enable the State of Missouri to meet goals established in its strategic plan to transform higher education by increasing the number of citizens earning post-secondary credentials, particularly in STEM related areas (CBHE). The impact of this Harris-Stowe led STEM initiative is significant. The institutions that comprise the MoLSAMP alliance produce the majority of all underrepresented students (African-Americans, Hispanics, Native Americans, and Pacific Islanders) who earn STEM degrees in Missouri. The overall objective is to increase the degree production from 262 at the inception of the grant to 600 by 2022. Since the start of the project in 2016, alliance institutions have seen more than 300 underrepresented minority students graduate with STEM degrees each year.

In April, 2019 Harris-Stowe was awarded a 2.2 million grant from the National Science Foundation to advance STEM Entrepreneurship. Harris-Stowe will collaborate with both the St. Louis Community Colleges and the Metropolitan Community College in Kansas City to create a statewide focus and reach in producing STEM entrepreneurs. A majority of underrepresented students are enrolled in these two community college systems.

**e. Continuous quality improvement and institutional accountability**

There are several avenues on which Harris-Stowe operates to drive constant quality development of its academic programs, including but not limited to, the following indicators of student achievement:

Percentage of Students Meeting Institutional Admission Standards

As an open enrollment institution, 100% of Harris-Stowe students meet its institutional admission standards. Though Harris-Stowe is an open enrollment institution, students meet the rigors of the STEM curriculum. The average grade point average for the 2019 entering cohort is a 2.91. That compares to a 2.3 average grade point average of the 2009 cohort. In addition 46% of the first-year class has a grade point average of a 3.0 or higher compared to 20% in 2009.

Success of Remediation Programs

Harris-Stowe participates in state and national initiatives focused on student success in remediation including Complete College America, AASCU's *Reimagine The First Year* initiative funded by the Bill and Melinda Gates Foundation and MDHE initiatives such as the Math and English co-requisite remediation efforts. Harris-Stowe has witnessed tremendous strides. A significant outcome is enrolling students in co-requisite courses, which allows students to complete remediation and college level coursework simultaneously. Harris-Stowe enrolls many students who would benefit from a summer transition program between high school and college. Some students need additional assistance to be prepared for the rigors of postsecondary education. The Hornet Summer Bridge Program, funded by the Enterprise Holdings and the Mysun Foundation serves, predominantly, first generation college students from urban communities. Many of the students are from under-served and under-resourced communities and school districts. The students who qualify are conditionally admitted to the University based on their ACT, SAT and/or placement test scores.

The program is a five week, residential experience that allow incoming, first-year students to attain tools that aid them with successfully transitioning from high school to college. The program, which focuses on improving students' cognitive and non-cognitive abilities and overall preparedness for college, afford students an opportunity to earn up to seven credit hours, at no cost to the student, in the summer before their first year in college. On-campus housing and meals are provided to all participating students. Having the students reside on campus allow Harris-Stowe to conduct activities designed to promote student success outside of class including participation in a variety of community service and team-building exercises.

The program, which serves 50 students each summer, began in 2015. University data indicate that students participating in the program have an increased retention rate and are graduating at faster rates than non-participants.



Success of STEM Summer Academy

A National Science Foundation Implementation grant has funded student support services including a STEM summer academy, peer tutoring, faculty and student conference travel and presentation, undergraduate research and mentoring that have impacted 398 total students. Moreover, evaluation data indicates that these activities, particularly mentoring when combined with summer academy participation, significantly increased the retention and persistence rates of STEM students. In sample cohorts from 2012-2016, retention for STEM students *not* participating in the summer academy was 40% from year 1 to year 2. Students who received mentoring and attended the summer academy were retained at a rate of 83% year 1-2 and 43% year 2-3.

Academic Partnerships

Harris-Stowe has developed relationships with a number of colleges and universities in the St. Louis region and across the State of Missouri. These partnerships provide students with undergraduate research opportunities and access to graduate programs in STEM disciplines. Success in these partnerships will inform the greater STEM education enterprise on new approaches to promote STEM student success, thereby serving an important role in the effort to expand and diversify the pool of qualified STEM graduates in the State of Missouri.

- Washington University in St. Louis School of Medicine
- Goldfarb School of Nursing
- Kansas City University School of Medicine and Biosciences
- St. Louis University Parks College of Engineering
- St. Louis College of Pharmacy

HSSU's increased academic collaborations, with institutions across Missouri, afford students opportunities to engage in academic learning at some the state's finest institutions. In addition, these partnerships enhance the academic inclusiveness that our partners are able to produce.

Student Retention Rate

A recent Washington Post article reported that 40 percent of black students majoring in STEM switch majors as undergraduates to leave STEM. This is not the narrative at HSSU. Increasing nearly 11 percent since 2016, the University has achieved a STEM retention rate of 67.1 percent.



Student Graduation Rate

HSSU is second, only to the University of Missouri Columbia, in graduating African-Americans in Mathematics among all institutions in Missouri. The institution's concentrated efforts aided the University with growing its competitiveness earning a National top 50 ranking for conferring degrees to African-Americans in mathematics. In addition Harris-Stowe's strength in biological sciences is evidenced by HSSU ranking second, only to the MU System (University of Missouri Columbia, University of Missouri St. Louis and University of Missouri Kansas City) in graduating African Americans in Biology.

Students Attending Graduate School

STEM graduates have earned master's degrees from institutions such as the University of Southern Illinois, Carbondale and Alabama A&M University. STEM graduates have also been accepted and enrolled in doctoral programs from institutions as diverse as University of Colorado, University of Kentucky, Washington University, Indiana University and the University of Columbia. In addition, the first cohort of students in the Harris-Stowe and St. Louis University 3+2 engineering program are currently completing their engineering degrees.

Measures of Student, Alumni and Employer Satisfaction

Harris-Stowe has an excellent opportunity and responsibility to facilitate and prepare a population of students who are underrepresented among American STEM degree holders and STEM professionals. Harris-Stowe has sought and successfully developed a network of collaborating STEM organizations and companies in the State of Missouri. These collaborations help provide students with an innovative and intensive program with many opportunities to complete research, interact with professional scientists and STEM entrepreneurs, and prepare for a variety of STEM career paths.

- National Science Foundation
- Emerson
- National Geospatial Intelligence Agency
- BioSTL
- Cortex
- Confluence Discovery Technologies/Aclaris
- Danforth Plant Science Center
- Millapore Sigma
- Missouri Botanical Garden
- Bayer
- Verizon
- St. Louis Zoo



HSSU leverages these collaborations to ensure that students experience work-based learning opportunities throughout their academic career. HSSU and its partners have established a pool of internship opportunities in startup, corporate, and academic environments to ensure students receive hands-on training and exposure to real-world STEM careers. HSSU leverages these internship relationships to, then, provide access to STEM employment opportunities. In addition, Harris-Stowe provides its STEM students significant undergraduate research experiences and the opportunity to present their findings at regional, state and national conferences. STEM students have received national recognition and awards for their research.

This pathway of deepening experiences is structured like an apprenticeship, where students gain research experiences in the classroom and in industry, learning alongside seasoned industry scientists. Components of the learning include: **Education:** Prerequisite STEM Courses; in-depth seminars in junior and senior year and industry-taught short courses and/or workshops in each summer internship session; **Internships:** paid summer internships around a research project with a specific mentor for each of the two summers, after their sophomore and junior years. Students will be expected to carry out research, write a paper summarizing the efforts and present the findings, and write a research/innovation proposal for successful completion of each internship session; **Employment:** For students that successfully complete their education at HSSU with a STEM degree as well as two summer internships, HSSU will work with partners to secure full-time employment.

This internship/employment model is designed based on regional learnings in concert with local Workforce Investment Boards and a regional STEM ecosystem alliance of employers and educators, STEMSTL, organized by BioSTL. The model is informed by best practices of NSF's Advanced Technological Education (ATE) centers, especially Bio-Link national Center of Excellence for Biotechnology and Life Science.

Continuous Quality Improvement

The University implemented an Assessment Academy whose members work to build policy and procedures for assessing academic operations being undertaken in all Colleges within the institution.

Harris-Stowe has also implemented a university performance dashboard to stay abreast (in real-time) of institutional trends in areas such as enrollment, student withdrawal, retained success, overall success, and course completions. The university dashboard is monitored by the university president and other stakeholders such as the Executive Cabinet which includes the supervisors of every campus unit. It allows for the Executive Cabinet to take pre-emptive measures if necessary to address critical issues that may affect the institution's essential quality improvement. Additional actions based on the factors reviewed include the identification of programs to be continued, reduced, or targeted for excellence, as indicated in §173.030 (9)(d).



The quality improvement at the program level thus far has culminated in a noteworthy upward trajectory in retention and substantive increase in the university's six-year graduation rate (over the past four years) in alignment with the critical component of statute §173.030 (9)(e).

The Higher Learning Commission places a premium on providing demonstrative evidence of responsibility for the quality of educational programs. Harris-Stowe State University has remained in good standing with the Higher Learning Commission (HLC) as an Open Pathways institution. Other specialized accreditations include the Council for the Accreditation of Educator Preparation (CAEP). The CAEP accreditation evaluation process is a rigorous one. It assures that quality in programming, and new teachers are provided the necessary skills for success in the classroom. Harris-Stowe's education program is accredited through the year 2024. The Anheuser-Busch School of Business has one of the largest contingencies of African-American, low income, first-generation students enrolled in the State of Missouri and is accredited by the Association of Collegiate Business Schools and Programs (ACBSP) and the International Assembly for Collegiate Business Education (IACBE). Yearly reports are submitted to each accrediting body consistent with the discipline specific accreditation mentioned in §173.030 (9)(b).

MISSION IMPLEMENTATION

Since 2007, Harris-Stowe State University has increased its STEM enrollment by 401%. The first-year cohort grade point average has increased from 2.4 (in 2009) to a 2.81 in 2018. The first to second-year retention rate for full-time STEM majors has increased from 39% in 2013-2014 to 69% in 2017-2018. By implementing a statewide mission in STEM education, Harris-Stowe seeks to significantly increase recruitment, retention and graduation rates through addressing the specific challenges inherent in the lack of STEM awareness, the challenges created by a rapidly changing STEM workforce and the need for real-world experience and diverse skills sets. This will be accomplished by three main objectives to be implemented over the next three years:

1. Introducing a reimagined curriculum and co-curricular activities designed to expand students understanding of STEM career paths, provide externship opportunities, and introduce and promote an entrepreneurial mindset and skills.
2. Providing incoming transfer students from community colleges with subsidized curriculum-based research experiences and STEM entrepreneurship experiences that will prepare them for other related activities identified in objectives 1 and 3.
3. Introducing activities that are designed to promote cognitive and non-cognitive skills critical for success in the contemporary STEM workforce or graduate school. The activities will include a peer and professional mentoring program, expanded undergraduate research opportunities, and an internship/apprenticeship program that will accommodate high performing students who have completed prerequisite courses and activities.



The impact of the innovative activities on student success and career trajectory will inform the greater STEM education enterprise on new approaches to promote STEM student success, thereby serving an important role in the effort to expand and diversify the pool of qualified STEM graduates in the St. Louis region and beyond.

CONCLUSION

For more than 160 years, Harris-Stowe State University has served the historically underrepresented. A mission that has made it a leader in the areas of STEM education. It has been at the forefront of equality and leadership—In 1863, Anna Brackett was appointed principal of the St. Louis Normal School (Harris-Stowe State University), becoming the first female principal of secondary school in the United States. In 1954, after the Supreme Court's landmark decision, *Brown v. Board of Education*, Harris-Stowe was one of the first higher education institutions to integrate. Harris-Stowe has continued its mission by substantially expanding program offerings, and in May of 2019 earning a multi-million-dollar National Science Foundation grant in the area of STEM entrepreneurship development. As an Open-Enrollment institution, Harris-Stowe State University seeks to continue its Mission to the citizens of Missouri by incorporating a statewide mission in STEM education.

Harris-Stowe is located in Missouri's economic and population hub, St. Louis. The region accounts for 40 percent of the state's economy, and the region is becoming a locus of technological innovation—the St. Louis Post Dispatch noted that technological listings were growing faster in St. Louis than any other large city in America. The Bureau of Labor Statistics confirmed that Missouri led the nation in computer system design, with St. Louis as the locus. Harris-Stowe offers a gateway to STEM education, which is the pathway for increased technological entrepreneurship and an opportunity to expand the benefits beyond the greater St. Louis area.

A statewide mission in the area of STEM education would serve to advance statewide technological entrepreneurship, which serves all Missourians. Certainly, Harris-Stowe's designation would not prevent other state universities from recruiting African-Americans and other underrepresented students to STEM programs, nor would it relieve their responsibility to provide an equitable and inclusive campus for underrepresented students, but on the contrary, the designation could serve as a bridge for inclusion and incorporating STEM advances for all of Missouri's citizens statewide, even providing recruitment and retention models that could be scaled statewide. HSSU officials are aware that granting a statewide mission will not prohibit any other institutions in Missouri from offering programs in these areas. It is worth noting that Harris-Stowe State University provides socio-economic diversity to statewide STEM efforts as well since STEM students match the institution's 83% student Pell-eligibility.

As such, and having demonstrated evidence satisfying all of the criteria outlined in Title XI Education and Libraries (§) 174.450, Harris-Stowe State University, an open enrollment



institution, respectfully requests the Coordinating Board's endorsement of a statewide mission in STEM for underrepresented and under resourced students.



**SAINT LOUIS
UNIVERSITY**

— EST. 1818 —

**VICE PRESIDENT FOR
RESEARCH**

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October 18, 2019

Zora Mulligan
Commissioner
Missouri Department of Higher Education & Workforce Development
205 Jefferson Street
P.O. Box 1469
Jefferson, City MO 65102

Dear Commissioner Mulligan:

The Office of the Vice President for Research at Saint Louis University (SLU) supports Harris-Stowe State University's (HSSU) application for a Statewide Mission in STEM to the Coordinating Board for Higher Education. This application represents Harris-Stowe's commitment to the educational and workforce development needs of the St. Louis region and the State of Missouri. Harris-Stowe has recently developed new STEM degrees, established an alliance of institutions across the state to increase the number of underrepresented students earning STEM degrees, and worked with industry to ensure that their STEM graduates are prepared to meet workforce demands. Such work is imperative if Missouri is to meet the needs of employers already in the state and those that it hopes to attract.

Through collaboration with HSSU, SLU faculty have continued to do great work by officially signing an agreement to offer students a dual degree in mathematics and engineering. The 3+2/3+3 program allows students to complete a math degree at Harris-Stowe and continue at SLU for either two years by majoring in interdisciplinary engineering or three years with a major in mechanical or computer engineering, ultimately earning an engineering degree from SLU. At the conclusion of five years, a student will graduate with two degrees.

We have also established an experiment at Harris-Stowe that studies the effects of climate change on agriculture using machine learning, unmanned aerial vehicles, satellite remote sensing, imaging science and computer vision. We have been training Harris-Stowe faculty and students in geographic information systems and remote sensing through a \$200,000 U.S. Department of Education grant. Dr. Jay Balakrishna of Harris-Stowe leads this project, titled, "Increasing Underrepresented Populations in Sustainability and Urban Ecology." Further, the NSF I-Corps Site program operated by SLU, of which HSSU is a partner, provides HSSU students experiential learning in entrepreneurship. This includes using the business model canvas, applying lean startup methodology, customer discovery interviews and ongoing mentorship as students pursue STEM-based ventures. Our collaboration strengthens our faculty, staff, students and region.

Higher purpose. Greater good.



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As Vice President for Research at Saint Louis University, I strongly endorse Harris-Stowe's application for a Statewide Mission in STEM. This is an important designation with statewide benefits. Thank you for your consideration.

Sincerely,

Ken Olliff
Vice President for Research
Director, Saint Louis University Research Institute
Saint Louis University
Phone: (773) 612-6484
Email: kolliff@slu.edu

October 21, 2019

Zora Mulligan
Commissioner
Missouri Department of Higher Education & Workforce Development
205 Jefferson Street
P.O. Box 1469
Jefferson, City MO 65102

Dear Commissioner Mulligan:

St. Louis College of Pharmacy supports Harris-Stowe State University's application for a Statewide Mission in STEM to the Coordinating Board for Higher Education. This application represents Harris-Stowe's commitment to serving the unmet educational and workforce development needs of the St. Louis region and of the State of Missouri. Harris-Stowe's recent work in developing new STEM degrees, establishing an alliance of institutions across the State to increase the number of underrepresented students pursuing and earning STEM degrees and their work with industry to ensure that their STEM graduates are prepared to meet workforce demands is imperative if Missouri is to meet the needs of employers already in the State and those that it hopes to attract in the future.

St. Louis College of Pharmacy has an MOU with Harris-Stowe to help them prepare to enter pharmacy, in particular, but other health care programs as well. Each year we host several Harris-Stowe students on our campus in our Organic Chemistry I and II classes because currently Harris-Stowe does not offer this pre-requisite that is necessary for admission to most health programs. We have found Harris-Stowe students to be engaged and committed to their education.

St. Louis College of Pharmacy strongly recommends that the Coordinating Board for Higher Education approves Harris-Stowe's application for a Statewide Mission in STEM. This is an important designation with statewide benefits. Thank you for your consideration.

Sincerely,



Kimberly Kilgore, Ph.D.
Dean of Arts & Sciences
Phone 314.446.8351
Kimberly.Kilgore@stlcop.edu



Zora Mulligan
Commissioner
Missouri Department of Higher Education & Workforce Development 205 Jefferson Street
P.O. Box 1469
Jefferson, City MO 65102

Dear Commissioner Mulligan:

STEMSTL supports Harris-Stowe State University's application for a Statewide Mission in STEM to the Coordinating Board for Higher Education. This application represents Harris-Stowe's commitment to serving the unmet educational and workforce development needs of the St. Louis region and the State of Missouri. Harris-Stowe's recent work in developing new STEM degrees, establishing an alliance of institutions across the State to increase the number of underrepresented students pursuing and earning STEM degrees and their work with industry to ensure that their STEM graduates are prepared to meet workforce demands is imperative if Missouri is to meet the needs of employers already in the State and those that it hopes to attract in the future.

STEMSTL is a collaborative consortium committed to equitable access to high-quality STEM learning and employment opportunities for all learners in the St. Louis metro region. By uniting community stakeholders, both in-school and out-of-school, around action-oriented workgroups and along defined pathways from early learning to education to the workforce, the St. Louis STEM Ecosystem will foster systemic change by:

- Building a Regional Culture of STEM Learning
- Enhancing In-Class STEM Education
- Ensuring In-Class Learning is Aligned with Quality and Accessible Out-of-Class STEM experiences
- Linking STEM Learning with College and Career Opportunities

Vision:

All learners in the St. Louis region have equitable access to high-quality STEM learning and employment opportunities.

Harris Stowe has been a strong collaborative partner in the Ecosystem from the very start. It was their support and forethought that help to complete the application process to join the National Ecosystem and launch the effort here in St. Louis. They played and continue to play a role in galvanizing people and organizations around the vision to close the equity gap in STEM Learning and Career Opportunities in the St. Louis Region.

STEMSTL strongly recommends that the Coordinating Board for Higher Education approves Harris-Stowe's application for a Statewide Mission in STEM. This is an essential designation with statewide benefits. Thank you for your consideration.

Sincerely,

Sherita M. Haigler

Sherita M. Haigler – Director
STEMSTL